

**Growth of India's Software Services Exports: An Empirical Analysis****Pallavi Sharda Garg, Assistant Professor****Indus Business Academy, Plot # 44, Knowledge Park 3,****Greater Noida. (U.P) – 201308****Abstract**

*The Indian IT industry has shown a phenomenal growth. The topic has been an interest of research from past many years. It has become the preferred outsourcing destination. There are numerous factors which have contributed to the growth of the industry but primarily it is because of the hardworking, affordable and technically sound workforce of India. They started with trivial jobs or what we call 'bodyshopping' which later moved up the value chain due to extraordinary technical skills of India graduates. The increase in the growth of exports of India promises a rosy picture. The current research has been undertaken to forecast the software export revenues using Holt- Winters exponential smoothing method. As per the analysis of the output the industry is expected to reach exports to the value of 190.36 US billion by the year ending 2025.*

**Keywords : Indian software exports, Holt – Winters Model, Forecasting.****Introduction**

Information technology (IT) sector of India has witnessed unparallel growth in the past few years. The industry has changed the image of India in front of the world as the land of super brains. Today the country is considered as the biggest IT capital of world and all the major industry leaders have their set up in the country. The industry started with trivial jobs sent to them by foreign clients and in return got dollars. Today the industry has moved up the value chain and is involved in more critical and analytical tasks. Heeks and Nicholson (2002) have emphasized that the trend in the industry today is of providing complete turnkey projects which initially started from supply of programming services. Projects executed by Indian software companies have moved up the value chain from low level programming to re-engineering, systems integration, tools and utilities into Intellectual property regime. Advent of Internet has created greater opportunities for Indian software industry to come out with world class tools, utilities, products and services. The industry has not achieved success overnight, but this success is the result of quality work completed within stipulated time at low costs.

The industry can be segregated into two major arms: IT services and business process outsourcing (BPO). The major source of revenue for the sector is through exports. As per NASSCOM, the forecasts for IT services exports in 2015-16 are highly positive (source: [www.livemint.com](http://www.livemint.com) ). The major thrust was given to the industry by the economic reforms in 1991 which led to the opening of economy and gave consolidation to the Indian players to expand their wings in the sector. The government also created a National Taskforce in 1999 under the leadership of then Prime Minister Mr. Atal Bihari Bajpayee who took keen interest in the development of the sector. The taskforce was given the task of framing recommendations within three months. The results of this taskforce led to major policy level changes which helped in creating fertile ground for the progress of the sector.

### Evolution of Indian IT industry

The evolution of IT industry of India can be divided into Pre- 1980, 1980 to 1990, 1990 to 2000, and Post 2000. In the **pre-1980 period** computers were used in industries and they were pre-loaded with software which was required. The computers were used in industries and they were pre-loaded with software which was required. Government had high tariffs and licensing to promote and protect the hardware industry. The government of India soon realized the opportunity to earn foreign exchange and therefore in 1972 floated the Software Export Scheme. 1974 onwards a new era started which paved the way of software exports from India. In July 1976 some new plans were announced to promote the NRI's to invest. This time period can be described as heavily regulated by the government. It also led to the departure of IBM from India. In the period during **1980 to 1990** the Government of India took several initiatives. But these were not able to promote strong software export as it was stopped by high import duty to be paid on hardware and low infrastructural facilities for software. This gave rise to new Computer policy in 1984 which simplified the import procedure and reduced the import duty on hardware. Later on, in the year 1986, the Software policy was reframed which made the software industry independent of hardware. Hardware imports were de-licensed in annual wage bill . The period from **1990 to 2000** can be termed as historical for IT industry. There were major initiatives taken by the government .Many changes happened in the Indian economy like Liberalization of trade, opening of economy to foreign investments, devaluation of rupee and less entry barriers. These changes actually attracted many foreign MNC's into India. It started with the 'OffShore Development' in which the companies worked from India for the clients and later matured into the 'Global Delivery Model' which is a combination of Offshore and Onshore. Then there were multiple Offshore Development centers set up by the companies into IT industry. During the period many companies entered the Indian shores and there was fierce competition among them. The **post-2000 era** was marked by the Y2K problem, dotcom crash and the recession at United States of America. The shortage of programmers in US forced many firms to outsource the work to India. This made India a hotspot for cheap, affordable and skilled manpower. It marked a new beginning for the India IT industry. After this, there has been no looking back. Ever since the IT sector of India has shown remarkable growth.

The Indian firms have a lot of work being outsourced from the American counterparts. This required intake of large number of professionally qualified graduates. This led to the proliferation of many engineering colleges providing trained graduates in computer science and information technology. Bigger companies like TCS, Wipro, and Infosys etc. opened up their own training centers to overcome this problem and to develop linguistic skills of these fresh recruits. To retain their leadership position there is also a conscious effort on the part of these companies to constantly upgrade the skills of their employees by providing high end certification programmes to match highest international standards. The Indian IT industry has done a lot to provide quality services to its customers. Apart from improving the skills of its employees, it also focused on various quality certifications. They have highest internationally recognized standards for software development

### Employment Generation

The Indian IT sector diversified its offerings by entering into the ITeS. ITeS can be defined as services which are offered from remote locations by utilizing the power of IT. It includes the call centers, medical transcriptionist, BPO, etc. The Indian IT-ITeS industry is India's largest employment generator in the organized sector of today creating jobs for over 7.5 million people both directly and indirectly, and as per NASSCOM research, this figure is expected to cross 10 million by 2010. ([www.banknetindia.com](http://www.banknetindia.com)). Most of the states in India have realized the growing employment opportunities created by the ITeS sector and therefore offering incentives to companies to open their centers.

**Table 1: Employment in IT-ITeS Industry (in millions) from 2001 - 14**

Year/ Item	01- 02	02- 03	03- 04	04- 05	05- 06	06-07	07- 08	08- 09	09-10	10- 11	11-12	12- 13	13- 14
IT Services & Exports	0.17	0.21	0.30	0.39	0.51	0.69	0.86	0.92	1.0	1.15	1.29	1.4	1.5
BPO Exports	0.11	0.18	0.22	0.32	0.42	0.55	0.70	0.79	0.77	0.83	0.88	0.92	0.95
Domestic Market	0.25	0.29	0.32	0.35	0.38	0.38	0.45	0.50	0.53	0.56	0.60	0.64	0.68
Total Employment	0.52	0.67	0.83	1.06	1.29	1.62	2.01	2.21	2.30	2.54	2.77	2.96	3.13

(Source: [www.mit.gov.in](http://www.mit.gov.in))

As per Table 1, the employment opportunities have increased manifold in the IT-ITeS sector. The total employment has increased to around 6% from the year 2001 – 2014. A bifurcation of the sector into subdivisions gives us a better picture. The IT services and exports showed an increase of around 9% in the employment opportunities from year 2001 – 2014. It was .17 million in 2001-02 and rose to around 1.5 million in year ending 2014. The BPO exports domain showed an increase of 8.6 % from 2001 – 2014 and the domestic market showed an increase of 2.7 % in employment opportunities. In the year ending 2014, the IT-ITeS industry has generated employment to the order of 3.13 million. The statistics give us a positive signal for the growth of the IT industry of India within the country as well as globally.

### Government Policy Initiatives

Gol was able to foresee the tremendous potential of the IT/ITeS industry and therefore specific measures were taken for the overall development of the industry. The industry has seen this phenomenal growth due to the efforts of the Gol also. Gol in the Computer Policy in 1984 stated that effective software export promotion is possible only if it is planned. Also it has to be interrelated with the development of hardware and system engineering (Government of India, 1985). This led to the formulation of Software Policy in 1986; this policy realized the role of software exports for the growth of the economy. It stated a list of procedures to simplify the production and development of software for domestic and export markets. It also gifted various tax benefits to the industry. With the advent of the economic reforms in 1990, the Finance ministry stated that India has advantage in software industry and not hardware. On the basis of this few policy initiatives were taken which led to no entry barriers for overseas firms and technology transfers. The private sector would be involved in policy formulation. Software development would be financed through Venture capital and equity. Steps would be taken to make data communication cheaper. Also there would be reduction in tariffs and duties. (Narayanamurthy, 2000). The government is still trying through various initiatives to make India an IT superpower.

The Gol has taken various measures to promote the Information Technology industry in India and abroad. A few broad initiatives are Infrastructure Support, R&D Promotion, Tax Incentives, Prioritisation of Electronics Hardware Manufacturing, Task Force. The major initiatives were liberalization of external trade, removal of duties on imports of IT products, reduction of controls on both inward and outward investments and foreign exchange and the fiscal measures taken by the Gol and the individual State

Governments. These initiatives are major causative factors for the sector to flourish in India and for the country to be able to attain a leading position in offshore services in the globe. The major fiscal incentives provided by the GoI have been for the Export Oriented Units (EOU), Software Technology Parks (STP), and Special Economic Zones (SEZ). ([www.mit.gov.in](http://www.mit.gov.in))

### **Software Services Exports**

Outstanding achievements in export have made India's software sector noticeable. There are majorly three sectors which are contributing for the growth of Indian economy viz : retail/ wholesale, software services and banking services. They have significant impact on the GDP of the country (Das et. al, 2011). Apart from the factors of economic development the policy level initiatives by the Government of India also ensured the growth of software sector. Sahoo & Nauriyal (2013) conclude that workforce, openness index and GDP of high income OECD countries have played a positive role in change of software exports from India. The software and service sector of India has been a major source of employment generation apart from adding to the GDP and export earnings (Kumar & Joseph, 2005). Carmel(2003) has formulated the 'Oval Model' which shows success factors for software exporting companies by taking India in backdrop.

### **Production & Growth Trend**

Production of Computer Software / Services has grown at an annual average growth rate of 18.08 percent (11.34 percent in US\$ terms). Export of Computer Software / Services (including ITES / BPO) registered a growth of 24.04 percent during the year 2012-13 over the year 2011-12. In value terms, export of this sector during 2012-13 was estimated to be Rs. 4612500 crore (US\$ 75000 million) up from Rs. 4183291 crore (US\$ 68021 million) estimated in the year 2011- 12. (Conversion rate @ \$ = Rs.61.5). The Indian IT-ITeS industry has shown a commendable growth since 2001. The Indian Software & Services industry revenue has grown from US\$ 10.2 billion in 2001-02 to reach US \$ 58.7 billion in 2008-09- translating to a CAGR of about 26.9 per cent.( Source : [www.escindia.in](http://www.escindia.in))

The share of India's IT industry to the country's GDP increased from 4.8 % in 2005-06 to 7% in 2008. India's Gross Domestic Production (GDP) at current prices is Rs. 114123.705 crore (US\$ 1855.67 billion). Computer Software / Services production of US\$ 94.38 billion accounts for a share of 18 percent in India's GDP at current prices during the year 2012-13. In 2009, seven Indian firms were listed among the top 15 technology outsourcing companies in the world. In March 2009, annual revenues from outsourcing operations in India amounted to ` 3000 billion and this is expected to increase to ` 11250 billion by 2020.

According to a report published by Electronics and Computer Software Export Promotion Council Export of Computer Software / Services (including ITES / BPO) registered a growth of 24.04 percent (10.26 percent in US\$ terms) during the year 2012-13 over the year 2011-12. In value terms, export of this sector during 2012-13 is Rs. 4612500 crore (US\$ 75000 million) up from Rs. 4183291.5 crore (US\$ 68021 million) estimated in the year 2011-12. World software and services market is dominated by USA with the share of 39 percent followed by Japan with the share of 12 percent. World total Software / Services market during the year 2012-13 is US\$ 960 billion. India's share in the world market during the year 2012-13 is 9.8 percent as compared to 9 percent estimated in the year 2011-12.

The current research has used the time series data( refer Table 2) compiled by Richard Heeks(2015) .

**Table 2: Software Exports for the Indian IT industry from 1980 – 2014, ( (US DOLLAR FIGURES (US\$ bn))**

Accounting Year	Software (IT Services)
1980 (Jan-Dec)	0.0040
1981	0.0068
1982	0.014
1983	0.018
1984	0.025
1985	0.028
1986	0.039
1987	0.054
1988/89 (Apr-Mar)	0.070
1989-90	0.105
1990-91	0.131
1991-92	0.194
1992-93	0.305
1993-94	0.447
1994-95	0.631
1995-96	0.794
1996-97	1.31
1997-98	1.92
1998-99	2.55
1999-00	3.71
2000-01	5.43
2001-02	6.30
2002-03	7.25
2003-04	8.86
2004-05	12.40
2005-06	17.06
2006-07	23.43
2007-08	32.89
2008-09	36.03
2009-10	36.23
2010-11	41.10
2011-12	48.63
2012-13	56.33
2013-14	63.24
2014-15	74.80

(Source: Heeks, R. (2015), Centre for Development Informatics, University of Manchester (https://ict4dblog.wordpress.com/tag/software-exports))

## Methodology

The current research uses Holt – winters exponential smoothing for forecasting the software exports growth. The model is used when the data shows trend as well as seasonality. The model could be additive or multiplicative. The model applies three smoothing formulas. First the mean needs to be smoothed to attain a local average value of the series. Thereafter, it is required to smooth the trend and finally every sub series is smoothed individually to give an estimate. The model used two smoothing constants for level and trend respectively. At any point in given time 't', two estimates are made; 'Lt for level and Tt for trend. They are calculated repeatedly from the value of 'Y' at time 't' and the earlier values of level and trend by two equations through exponential smoothing.

Suppose the level and trend at time 't-1' is shown through Lt-1 and Tt-1 then forecasted Yt would be Lt-1 + Tt-1. The updated values of level is computed repeatedly by interpolating between Yt and its forecast, Lt-1 + Tt-1, using  $\alpha$  and 1-  $\alpha$

$$L_t = \alpha Y_t + (1-\alpha)(L_{t-1} + T_{t-1})$$

The updated values of trend are calculated repeatedly by interpolating between Lt-Lt-1 and the earlier value of the trend, Tt-1 using  $\beta$  and 1- $\beta$

$$T_t = \beta(L_t - L_{t-1}) + (1-\beta)T_{t-1}$$

Finally, in order to forecast future estimates at time 't', we extrapolate the updated level and trend

$$\hat{Y}_{t+k} = L_t + kT_t$$

The error is calculated through:

$$\text{Error} = (Y_t - \text{Forecasted})^2$$

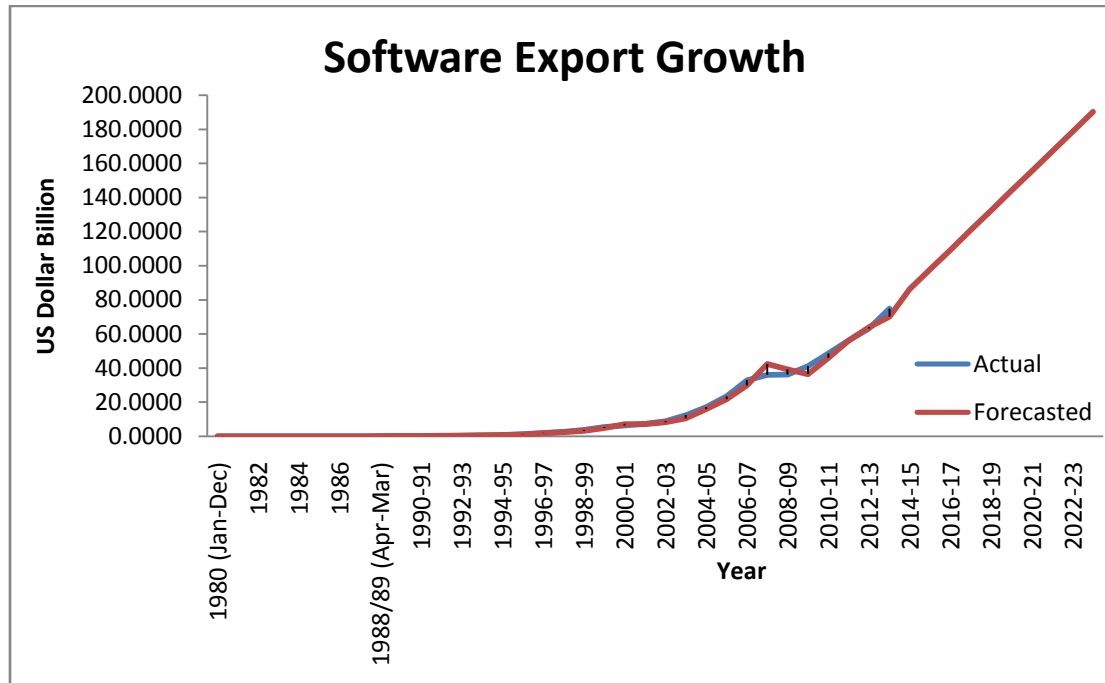
And the mean square error is minimized through minimizing the values of  $\alpha$  and  $\beta$ .

### Analysis of Model Output-,Table 3: Predicted Software Exports for the Indian IT industry through Holt-

#### Winters exponential smoothing method 2015 – 2025 (US DOLLAR(US\$ bn))

Accounting Year	Software (IT Services)
2015-16	86.35
2016-17	97.91
2017-18	109.47
2018-19	121.02
2019-20	132.58
2020-21	144.14
2021-22	155.69
2022-23	167.25
2023-24	178.81
2024-25	190.36

The researcher has used Holt winters exponential smoothing method to arrive at the forecasts for the next 10 years for software exports for India. As per the analysis of the output the industry is expected to reach exports to the value of 190.36 US billion by the year ending 2025. The forecast for the next year i.e. 2016 is about 86.35 US billion.



**Fig 1: Actual and Predicted Software Export Growth**

### Conclusion

The Indian IT industry has shown remarkable growth in past decade and will continue to do so in the near future also. The industry is moving up the value chain and is now involved in high end projects on social media, analytics and cloud. Industry is endowed with resources which have made it possible to retain its position of topmost outsourcing destination. The forecasts for the industry hold promising future but still with the emergence of competition from countries like China, India needs to be careful.

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